

Answers to Coursebook exercises

2 Sequences and functions

Exercise 2.1 Generating sequences

- 1 **a** linear, term-to-term rule 'add 4'
b linear, term-to-term rule 'add 10'
c non-linear, term-to-term rule 'add 1, add 2, add 3, add 4, ...'
d non-linear, term-to-term rule 'subtract 2, subtract 3, subtract 4, subtract 5, ...'
e linear, term-to-term rule 'subtract 5'
f non-linear, term-to-term rule 'subtract 3, subtract 6, subtract 9, subtract 12, ...'
g linear, term-to-term rule 'add 0.5'
h non-linear, term-to-term rule 'add 2, add 4, add 8, add 16, ...'
i linear, term-to-term rule 'subtract 8'
- 2 **a** 8, 3, -2, -7 **b** $2\frac{1}{2}, 4, 5\frac{1}{2}, 7$ **c** 4, 5, 7, 10 **d** 24, 12, 6, 3
- 3 42. Check students' methods.
- 4 243. Check students' methods.
- 5 **a** 6, 7, 8, 9 **b** 2, 5, 8, 11 **c** 5, 8, 13, 20 **d** 3, 12, 27, 48
- 6 **a i** 21 **ii** 41 **iii** 81 **b i** 23 **ii** 98 **iii** 398
- 7 C
- 8 Question 1: term = $2 \times \text{position number} + 7$
 Answer: 2nd term = 11 3rd term = 13
 Question 2: term = $5 \times \text{position number}^2$
 Answer: 1st term = 5 3rd term = 45

Exercise 2.2 Finding the n th term

- 1 3, 6, 9; 30
- 2 5, 4, 3; -14
- 3 11, 15, 19; 207
- 4 2, 12, 22; 992
- 5 A vi, B iv, C i, D v, E ii, F iii
- 6 **a** $2n + 1$ **b** $3n + 2$ **c** $5n - 1$ **d** $8n - 6$ **e** $10 - 2n$
f $15 - 4n$ **g** $3 - 5n$ **h** $9n - 12$ **i** $12n + 11$
- 7 **a** 201 **b** 302 **c** 499 **d** 794 **e** -190
f -385 **g** -497 **h** 888 **i** 1211
- 8 No. The term-to-term rule is 'add $\frac{1}{2}$ ', so although Jake got the first part correct ($\frac{1}{2}n$), the first term $\frac{1}{2} + 4$ is not 4, so he got the second part wrong. The correct answer $\frac{1}{2}n + 3\frac{1}{2}$.
- 9 The sequence is decreasing, so the n th term expression for this sequence cannot start with $6n$ as this would give an increasing sequence.
- 10 Yes. Each pattern increases by 3 squares (the term-to-term rule is 'add 3'), so the n th term will start with $3n$. The number of squares in the patterns is 5, 8, 11, 14, and $3 \times 1 + 2 = 5$, $3 \times 2 + 2 = 8$, $3 \times 3 + 2 = 11$, $3 \times 4 + 2 = 14$.

Unit 2 Answers to Coursebook exercises

Exercise 2.3 Finding the inverse of a function

- 1 a $y = x - 9$ b $y = x + 1$ c $y = \frac{x}{3}$ d $y = 6x$
2 a $x \rightarrow x - 3$ b $x \rightarrow x + 8$ c $x \rightarrow \frac{x}{4}$ d $x \rightarrow 3x$
3 a $y = \frac{x-5}{2}$ b $y = \frac{x+7}{4}$ c $y = 2(x-1)$ d $y = 3x + 4$
4 a $x \rightarrow \frac{x-1}{5}$ b $x \rightarrow \frac{x+7}{3}$ c $x \rightarrow 5(x+10)$ d $x \rightarrow 4x - 9$
5 a i $x \rightarrow 10 - x$ ii $x \rightarrow \frac{x-1}{-2}$ or $\frac{1-x}{2}$ or $1 - \frac{x}{2}$
 iii $x \rightarrow 4 - x$ iv $x \rightarrow \frac{x-3}{-4}$ or $\frac{3-x}{4}$
 b i and iii
6 a $x \rightarrow 4(x+13)$ b $\frac{6}{4} - 13 = -11.5$

End-of-unit review

- 1 Non-linear; the term-to-term rule is 'subtract 1, subtract 2, subtract 3, ...'
2 14. Check students' methods.
3 12. Check students' methods.
4 i 0, 6, 16, 30 ii 198 iii 798
5 a $2n + 3$ b $12 - 2n$ c $3n - 11$
6 The sequence is increasing so it can't have a $-6n$ term, as this would make the sequence decrease.
7 Anders. Each pattern increases by 2 dots (the term-to-term rule is 'add 2'), so the n th term will start with $2n$. The number of dots in the patterns is 4, 6, 8, 10, and $2 \times 1 + 2 = 4$, $2 \times 2 + 2 = 6$, $2 \times 3 + 2 = 8$, $2 \times 4 + 2 = 10$.
8 a $y = x + 2$ b $y = \frac{x}{8}$ c $y = 5(x-2)$ d $y = 2x - 1$
9 a $x \rightarrow x - 1$ b $x \rightarrow 4x$ c $x \rightarrow \frac{x+7}{3}$ d $x \rightarrow 10x - 2$
10 a $x \rightarrow \frac{x-11}{4}$ b $4 \times -1.2 + 11 = 6.2$
11 a $x \rightarrow 2(x + 22.5)$ b $\frac{50}{2} - 22.5 = 2.5$